

**In the Claims:**

1. (currently amended) A device for transferring electric currents, comprising:  
a slip ring unit comprising a rotor with connecting wires and a stator; and  
a printed circuit board fastened to said rotor, wherein said printed circuit board comprises conductors ~~connectors~~ in electrical contact with said connecting wires, wherein a torque required for rotary movement between said rotor and said stator is introduced via said printed circuit board.
2. (original) The device in accordance with claim 1, wherein said connecting wires transmit current and are arranged in a geometrically determined pattern out of said rotor, and said printed circuit board comprises connecting points that are connected with said connecting wires and that are arranged in a pattern that is in accordance with said geometrically determined pattern.
3. (original) The device in accordance with claim 1, wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor.
4. (currently amended) The device in accordance with claim 2, wherein, starting at said connecting points, one or several of said conductors ~~connectors~~ over at least a partial area of said printed circuit board are directed radially away from an axis of rotation of said slip ring unit.

5. (previously amended) The device in accordance with claim 2, wherein said geometrically determined pattern of said connecting wires is designed in such a way that said printed circuit board can only be attached in a predetermined position.

6. (original) The device of claim 1, further comprising a remote-controlled object that transmits and/or receives electrical currents via said slip ring unit.

7. (original) The device of claim 6, wherein said remote-controlled object comprises a camera.

8. (currently amended) A device for transferring electric currents, comprising:  
a slip ring unit comprising a rotor with connecting wires and a stator; and  
a printed circuit board fastened to said rotor, said printed circuit board  
comprising:

conductors ~~connectors~~ in electrical contact with said connecting  
wires of said rotor; and

connecting points;

wherein a torque required for rotary movement between said rotor and said stator is introduced via said printed circuit board, wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor and several ones of said connecting wires are conducted out of said rotor for transmitting current in accordance with a

geometrically determined pattern, and said connecting points with said connecting wires are arranged in a pattern that is in accordance with said geometrically determined pattern.

9. (currently amended) A device for transferring electric currents, comprising:  
a slip ring unit comprising a stator with connecting wires and a rotor; and  
a printed circuit board fastened to said stator and comprising conductors  
~~connectors~~ that are in electrical contact with said connecting wires of said stator, wherein said printed circuit board is used as a torque support.

10. (currently amended) The device in accordance with claim 9, wherein several ones of said connecting wires are conducted out of said stator in accordance with a geometrically determined pattern, and said connecting wires ~~connectors~~ are arranged in a pattern that is in accordance with said geometrically determined pattern.

11. (original) The device in accordance with claim 9, wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor.

12. (previously amended) The device in accordance with claim 10, wherein one or several of said conductors ~~connectors~~ over at least a partial area of said printed circuit board are directed radially away from an axis of rotation of said slip ring unit.

13. (previously amended) The device in accordance with claim 10, wherein said

geometrically determined pattern of said connecting wires is designed in such a way that said printed circuit board can only be attached in a predetermined position.

14. (original) The device of claim 9, further comprising a remote-controlled object that transmits and/or receives electrical currents via said slip ring unit.

15. (original) The device of claim 14, wherein said remote-controlled object comprises a camera.

16. (currently amended) A device for transferring electric currents, comprising:  
a slip ring unit comprising a stator with connecting wires and a rotor; and  
a printed circuit board fastened to said stator, said printed circuit board comprising:

conductors ~~connectors~~ that are in electrical contact with said connecting wires of said stator; and

connecting points, wherein said printed circuit board is used as a torque support;

wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor and several ones of said connecting wires are conducted out of said stator in accordance with a geometrically determined pattern and said connecting points with said connecting wires on said printed circuit board are arranged in a pattern that is in accordance with said geometrically determined pattern.

17. (currently amended) A device for transferring electric currents to, or from a remote-controlled camera, comprising:

a slip ring unit comprising a rotor with connecting wires and a stator; and

a printed circuit board fastened to said rotor, said printed circuit board

comprising:

conductors ~~connectors~~ that are in electrical contact with a remote-controlled camera and said connecting wires of said rotor; and

connecting points;

wherein a torque required for rotary movement between said rotor and said stator is introduced via said printed circuit board, wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor, and several ones of said connecting wires are conducted out of said rotor in accordance with a geometrically determined pattern, and said connecting points with said connecting wires on said printed circuit board are arranged in a pattern that is in accordance with said geometrically determined pattern, wherein said geometrically determined pattern of said connecting wires is designed in such a way that said printed circuit board can only be attached in a predetermined position.

18. (New) A device for transferring electric currents to, or from a remote-controlled camera, comprising:

a slip ring unit comprising a rotor with connecting wires and a stator, which

has a substantially hollow-cylindrical form; and

a printed circuit board fastened to said rotor, said printed circuit board comprising:

- a flexible flat cable plug;
- strip conductors having a first end and a second end, wherein said first end is in electrical contact with said connecting wires of said rotor and said second end is in electrical contact with said flexible flat cable plug; and
- connecting points;

wherein a torque required for rotary movement between said rotor and said stator is introduced from at least one engagement pin via said printed circuit board, wherein an outer portion of said slip ring unit is used as said stator and an inner portion of said slip ring unit is used as said rotor, and several ones of said connecting wires are conducted out of said rotor in accordance with a geometrically determined pattern, and said connecting points with said connecting wires on said printed circuit board are arranged in a pattern that is in accordance with said geometrically determined pattern, wherein said geometrically determined pattern of said connecting wires is designed in such a way that said printed circuit board can only be attached in a predetermined position.

19. (New) A remote-controlled camera system, comprising:
  - a camera;
  - a stationary board comprising a socket;
  - a pivot platform comprising at least one engagement pin;
  - a slip ring unit comprising:

a rotor with connecting wires which are conducted inside said slip ring unit;

a stator, which has a substantially hollow-cylindrical form and has a plug which is inserted into said socket;

a printed circuit board fastened to said rotor, said printed circuit board comprising:

a flexible flat cable plug;

strip conductors having a first end and a second end, wherein said first end is in electrical contact with said connecting wires of said rotor and said second end is in electrical contact with said flexible flat cable plug; and

connecting points;

wherein, starting at said connecting points, one or several of said strip conductors over at least a partial area of said printed circuit board are directed radially away from an axis of rotation of said slip ring unit;

wherein a torque required for rotary movement between said rotor and said stator is introduced from at least one engagement pin via said printed circuit board, and several ones of said connecting wires are conducted out of said rotor in accordance with a geometrically determined pattern, and said connecting points with said connecting wires on said printed circuit board are arranged in a pattern that is in accordance with said geometrically determined pattern.

## **REMARKS**

### **A. Supplemental Information Disclosure Statement**

Applicant is filing a Supplemental Information Disclosure Statement concurrently with the filing of the present Amendment. Applicant requests that the references cited therein be considered by and made of record by the Examiner.

### **B. 35 U.S.C. § 102**

#### **1. Larsen et al.**

In the Office Action of March 27, 2003, claims 1-3, 6 and 8 were rejected under 35 U.S.C. § 102(b) as being anticipated by Larsen et al. Applicant traverses this rejection. Claims 1 and 8 each recite that “a torque required for rotary movement between said rotor and said stator is introduced via said printed circuit board.” The Office Action has relied on the passage at column 1, lines 13-15 as disclosing the recited torque. However, the passage is silent about a printed circuit board introducing a torque for rotary movement between a rotor and stator. Reliance on the passage is improper because it refers to known slip ring systems while the rejection relies on the embodiment of FIG. 2 of Larsen et al. In other words, the rejection is improperly relying on elements of different embodiments to anticipate the claims. The proper analysis is to rely on a single embodiment.

In column 5, lines 47-68 and column 6, lines 1-18 of Larsen et al., there is described the arrangement of a slip ring according to figure 2. In this embodiment, a housing 44 is formed as an integral part of the rotor 26. The spindle 28 belongs to the rotor 26. In addition, a plurality of individual, spaced, annular contact rings 32 are mounted on one end of the spindle 28. In this



embodiment, the torque required for rotary movement of the slip ring is introduced via the rotor 26. There is no mechanical stress on the circuit board 40 during rotation movement caused by the torque as the circuit board 40 is fixedly mounted in the housing 44. So Larsen et al. teaches to use a housing to protect the circuit board 40 from mechanical stress caused by the torque which is required for rotary movement of a slip ring. This is in direct contrast to claims 1 and 8 where the printed circuit board introduces a torque. Accordingly, claims 1 and 8 and their dependent claims 2, 3 and 6 are not anticipated by Larsen et al.

Besides not being anticipated by Larsen et al., claims 1 and 8 are not rendered obvious by Larsen et al. As mentioned above, Larsen et al. explicitly desires to minimize the mechanical stresses, such as torques, applied to the circuit board 40. This teaches away from the inventions of claims 1 and 8 which require that the printed circuit board itself introduce a torque for rotary movement between the rotor and the stator. Such a teaching away is evidence that claims 1 and 8 and their dependent claims are not rendered obvious by Larsen et al.

Note that claims 1 and 8 have been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo Corporation v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (*en banc*), *overruled in part*, 535 U.S. 722, 122 S. Ct. 1831 (2002).

## **2. England et al.**

Claims 9, 10 and 14 were rejected under 35 U.S.C. § 102(e) as being anticipated by England et al. Applicant traverses this rejection. Claim 9 recites a slip ring unit. The Office

Action asserts that item 1 disclosed in England et al. is a slip ring unit. However, item 1 is a motor (Col. 4, ll. 24-25) and not a slip ring unit. Since England et al. fails to disclose a slip ring unit, claim 9 is not anticipated by England et al. Accordingly, the rejection is improper and should be withdrawn.

The rejection is improper for the additional reason that England et al. fails to disclose having printed circuit board 13 used as a torque support as recited in claim 9.

Besides not being anticipated by England et al., claim 9 is not rendered obvious by England et al. As pointed out above, England et al. recites using an electric motor 1. Since an electric motor and a slip ring unit are entirely different from one another, there is no suggestion to replace England et al.'s motor 1 with a slip ring unit. In addition, there is no suggestion to have England et al.'s printed circuit board 13 used as a torque support. Without suggestion to replace motor 1 with a slip ring unit and using circuit board 13 as a torque support, the claims are not rendered obvious by England et al.

Note that claim 9 has been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo*

**C. 35 U.S.C. § 103**

**1. Larsen et al. and Kameda et al.**

Claims 4 and 5 were rejected under 35 U.S.C. § 103 as being obvious in view of Larsen et al. and Kameda et al. Applicant traverses this rejection. Claims 4 and 5 depend indirectly on claim 1. As stated above in Section B.1., Larsen et al. does not suggest having its circuit board

40 introduce a torque for rotary movement between a rotor and a stator. Kameda et al. does not cure the deficiencies of Larsen et al., since Kameda et al. does not suggest altering Larsen et al. so that Larsen et al.'s circuit board 40 introduces a torque. Without such suggestion, the rejection is improper and should be withdrawn.

Note that claim 4 has been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo*.

**2. Larsen et al. and Taguchi et al.**

**a. Claim 7**

Claim 7 was rejected under 35 U.S.C. § 103 as being obvious in view of Larsen et al. and Taguchi et al. Applicant traverses this rejection. Claim 7 depends indirectly on claim 1. As stated above in Section B.1., Larsen et al. does not suggest having its circuit board 40 introduce a torque for rotary movement between a rotor and a stator. Taguchi et al. does not cure the deficiencies of Larsen et al., since Taguchi et al. does not suggest altering Larsen et al. so that Larsen et al.'s circuit board 40 introduces a torque. Indeed, Taguchi et al. concerns an electrical driving device for winding a film within a camera. Without suggestion to alter Larsen et al. so that the circuit board 40 introduces a torque, the rejection is improper and should be withdrawn.

**b. Claim 17**

Claim 17 was rejected under 35 U.S.C. § 103 as being obvious in view of Larsen et al. and Taguchi et al. Applicant traverses this rejection. Claim 17 recites having the printed circuit board introducing a torque for rotary movement between a rotor and a stator. As stated above in

Section C.2.a., there is no suggestion in either Larsen et al. or Taguchi et al. to alter Larsen et al.'s system so that Larsen et al.'s circuit board 40 introduces a torque. Without such suggestion, the rejection is improper and should be withdrawn.

Note that claim 17 has been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo*.

**3. England et al. and Larsen et al.**

**a. Claim 11**

Claim 11 was rejected under 35 U.S.C. § 103 as being obvious in view of England et al. and Larsen et al. Applicant traverses this rejection. Claim 11 depends directly on claim 9. As stated above in Section B.2., England et al. does not suggest 1) replacing its motor 1 with a slip ring unit and 2) using its printed circuit board 13 as a torque support. Larsen et al. does not cure the deficiencies of England et al., since Larsen et al. does not suggest altering England et al. so that England et al.'s motor is replaced by a slip ring unit and England et al.'s circuit board 13 is used as a support. Without such suggestion, the rejection is improper and should be withdrawn.

**b. Claim 16**

Applicant traverses this rejection. Claim 16 recites having a slip ring unit and having a printed circuit board used as a torque support. As stated above in Section C.3.a., there is no suggestion in either England et al. or Larsen et al. to alter England et al.'s system so that England et al.'s motor 1 is replaced by a slip ring unit and England et al.'s circuit board 13 is used as a torque support. Without such suggestion, the rejection is improper and should be withdrawn.

Note that claim 16 has been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo*

**4. England et al. and Kameda et al.**

Claims 12 and 13 were rejected under 35 U.S.C. § 103 as being obvious in view of England et al. and Kameda et al. Applicant traverses this rejection. Claims 12 and 13 depend indirectly on claim 9. As stated above in Section B.2., England et al. does not suggest 1) replacing its motor 1 with a slip ring unit and 2) using its printed circuit board 13 as a torque support. Kameda et al. does not cure the deficiencies of England et al., since Kameda et al. does not suggest altering England et al. so that England et al.’s motor is replaced by a slip ring unit and England et al.’s circuit board 13 is used as a support. Without such suggestion, the rejection is improper and should be withdrawn.

Note that claim 12 has been amended to correct a translation error in that the word “connectors” should have been translated as “conductors.” Accordingly, the amendment is not being presented for reasons of patentability as defined in *Festo*

**5. England et al. and Taguchi et al.**

Claim 15 was rejected under 35 U.S.C. § 103 as being obvious in view of England et al. and Taguchi et al. Applicant traverses this rejection. Claim 15 depends indirectly on claim 9. As stated above in Section B.2., England et al. does not suggest 1) replacing its motor 1 with a slip ring unit and 2) using its printed circuit board 13 as a torque support. Taguchi et al. does not cure the deficiencies of England et al., since Taguchi et al. does not suggest altering England et

al. so that England et al.'s motor is replaced by a slip ring unit and England et al.'s circuit board 13 is used as a support. Without such suggestion, the rejection is improper and should be withdrawn.

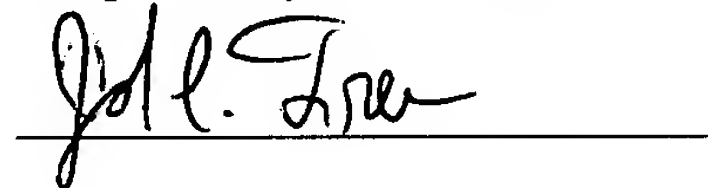
**C. New Claims 18 and 19**

New claims 18 and 19 each recite a printed circuit board that introduces a torque for rotary movement between a rotor and a stator and so are patentable over Larsen et al. for reasons similar to those given above in Section B.1 In addition, claims 18 and 19 each recite a slip ring unit and so are patentable over England et al. for reasons similar to those given in Section B.2.

**CONCLUSION**

In view of the arguments above, Applicant respectfully submits that all of the pending claims 1-19 are in condition for allowance and seeks an early allowance thereof. If for any reason, the Examiner is unable to allow the application in the next Office Action and believes that an interview would be helpful to resolve any remaining issues, she is respectfully requested to contact the undersigned attorneys at (312) 321-4200.

Respectfully submitted,



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